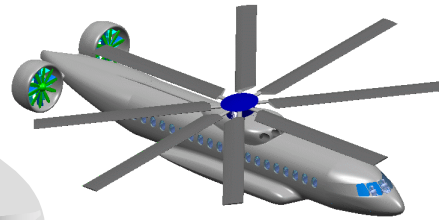


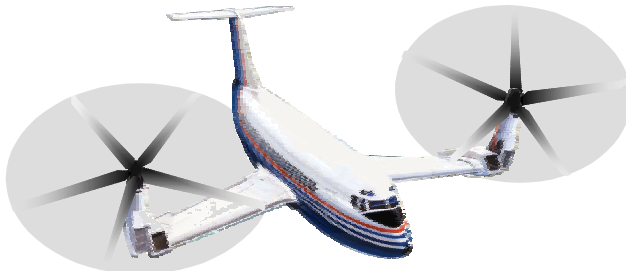
## ***NASA-sponsored Studies Identify Innovative Concepts for Runway-independent Transportation***



**Quad Tiltrotor**



**High Speed Rotor**



**Tiltrotor**

### **BACKGROUND**

The NASA Rotorcraft program is sponsoring a number of studies to establish the role of vertical flight aircraft in the air transportation system of the future. Operating without a need for runways, these aircraft can greatly offload saturated runways, significantly reducing delays and increasing the throughput capacity of busy airports.

### **OBJECTIVES**

The objective of this effort is to define system needs, air vehicle concepts, and advanced technologies that will enable the development and operation of runway independent aircraft for stage lengths of up to 600 miles.

### **ACCOMPLISHED**

In July 2001, three contractors (Bell, Boeing, and Sikorsky) reported on their assessments of a wide range of concepts for 40-to-120-passenger vertical and short takeoff and landing (V/STOL) airliners. Configurations examined include conventional solutions (helicopter, compound helicopter, tilt wing, tilt rotor) and unconventional ones (lift fan, unconventional rotors, canard rotor wing, folding rotors, etc.). All three studies identified a need for improvements in cost per seat mile, noise, passenger acceptability, and reliable all-weather service, and all three saw a need for higher speed to reduce cost per seat mile and trip time.

Advanced technologies that could achieve the desired attributes include active controls, adaptive flow control, nanotube structures, advanced flight controls, advanced drive systems, and morphing (i.e., shape-changing) rotors, lifting and control surfaces, and fuselages.

### **FUTURE PLANS**

The next phase, to be accomplished in September 2001, is to study the benefits of advanced technologies for vehicle designs employing each of the selected concepts. The results are expected to guide and prioritize research to enable the runway independent aircraft of the future.

*For additional information, contact George Price, NASA Rotorcraft Program, Ames Research Center, California  
Telephone: (650) 604-4549  
E-mail: [gprice@mail.arc.nasa.gov](mailto:gprice@mail.arc.nasa.gov)*